

## CLAIMS

What is claimed is:

1. A method for discriminating between textual content and graphical content in an image comprising:
  3. receiving a plurality of pixel values for a pixel line segment;
  4. calculating a plurality of spatial gradients based on pixel values of adjacent pixels;
  5. determining a smoothness index by processing the plurality of spatial gradients; and
  6. identifying the pixel line segment as one of a text segment or a graphic segment by comparing the smoothness index to a threshold value.
2. The method of claim 1 wherein the step of calculating a plurality of spatial gradients comprises the step of subtracting an adjacent pixel value from a current pixel value for each of the plurality of pixel values.
3. The method of claim 1 wherein the step of determining a smoothness index comprises:
  1. calculating a first statistical characteristic of the plurality spatial gradients;
  2. calculating a second statistical characteristic of the plurality of spatial gradients;
  3. dividing the second statistical characteristic by the first statistical characteristic to generate the smoothness index.
1. 4. The method of claim 3 wherein calculating a first statistical characteristic comprises:
  2. squaring each of the spatial gradients to generate a plurality of squared gradients; and
  3. generating the first statistical characteristic by summing the squared gradients.
1. 5. The method of claim 3 wherein calculating a second statistical characteristic comprises:
  2. generating a plurality of absolute gradients by determining an absolute value of each of the spatial gradients;
  4. determining a sum value by summing the absolute gradients; and
  5. generating the second statistical characteristic by squaring the sum value.

1    6. A method for discriminating between textual content and graphical content in an image  
2    comprising:  
3       receiving a first plurality of pixel values for a pixel line segment and a second plurality of  
4       pixel values for the pixel line segment;  
5       calculating a plurality of spatial gradients for the pixel line segment based on the first  
6       plurality of pixel values of adjacent pixels;  
7       determining a smoothness index by processing the plurality of spatial gradients;  
8       calculating a value by combining the second plurality of pixel values; and  
9       identifying the pixel line segment as one of a text segment or a graphic segment by  
10      comparing the smoothness index to a first threshold value and the calculated value of the second  
11      plurality of the pixel values to a second threshold value.

7. The method of claim 6 wherein the step of calculating a plurality of spatial gradients  
comprises the step of subtracting an adjacent pixel value from a current pixel value for each of  
the first plurality of pixel values.

8. The method of claim 6 wherein the step of determining a smoothness index comprises:  
calculating a first statistical characteristic of the plurality spatial gradients;  
calculating a second statistical characteristic of the plurality of spatial gradients;  
dividing the second statistical characteristic by the first statistical characteristic to generate  
the smoothness index.

1    9. The method of claim 8 wherein calculating a first statistical characteristic comprises:  
2       squaring each of the spatial gradients to generate a plurality of squared gradients; and  
3       generating the first statistical characteristic by summing the squared gradients.

1    10. The method of claim 9 wherein calculating a second statistical characteristic comprises:  
2       generating a plurality of absolute gradients by determining an absolute value of each of the  
3       spatial gradients;  
4       determining a sum value by summing the absolute gradients; and  
5       generating the second statistical characteristic by squaring the sum value.

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- 1 11. The method of claim 6 wherein the step of calculating a value by combining the second  
2 plurality of pixel values further comprises the step of calculating the maximum of the second  
3 plurality of pixel values.
- 1 12. The method of claim 6 further comprising the steps of:  
2 receiving a third plurality of pixel values for the pixel line segment; and  
3 calculating a value by combining the third plurality of pixel values, and wherein the step of  
4 identifying the pixel line segment as one of a text segment or a graphic segment further  
5 comprises comparing the calculated value of the third plurality of pixel values to a third  
6 threshold value.
- 1 13. The method of claim 12 wherein the step of calculating a value by combining the third  
2 plurality of pixel values comprises the step of calculating the maximum of the third plurality of  
3 pixel values.